

REMARKS

Claims 1-26 are pending in the above-identified application. Claims 1-19 and 22-26 were rejected. With this Amendment, claims 1, 13, and 15 were amended. Accordingly, Claims 1-19 and 22-26 remain at issue. Claims 20 and 21 have been allowed.

I. 35 U.S.C. § 112 Indefiniteness Rejection of Claims

Claims 9, 10 and 23 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In particular, the Examiner states it is unclear how the “mirror section” and the “hinge section” are to be both integral and formed on separate surfaces of a substrate as required by Claims 1, 10 and 23. To support the indefiniteness rejection, the Examiner notes that in Fig. 4 of the current application the mirror (12) and the movable section (13) are both connected to a single surface of the substrate (11).

Applicants disagree that Claims 9, 10, and 23 are indefinite and respectfully traverse this rejection.

Initially, Applicants submit that Fig. 4 has been amended to be consistent with the remaining figures and the specification in identifying the hinge section 13 (*e.g.* the portable section 13A and the fixed section 13B) and the mirror section 12 as being integrally formed from the same film 27. (*See*, Application at pg. 5, line 12-pg. 6, line 8, and pg. 8, line 7-pg. 9, line 24.)

Referring to Figures 5B and 8B as illustrative views, Applicants teach and claim that the substrate 11 may be formed to have a slant surface 111 for forming the mirror section 12 and to have a flat surface 100 for forming the hinge section 13. (*See*, Application at pg. 8, line 7-13.)

A film 27 deposited over both the slanted surface 111 and the flat surface 100 of the substrate allows the mirror section 12 and the hinged section 13 to be integrally formed such that the mirror section 12 extends from the movable section 13A of the hinge section 13 and is formed slanted to the flat surface of the movable section 13A as claimed by Applicants.

Thus, Applicants clearly identify how the mirror section 12 and the hinge section 13 are integrally formed on two different surfaces (*e.g.*, the slant surface 111 and the flat surface 100) of the substrate 11. Accordingly, Applicants respectfully request that the §112 rejection be withdrawn.

II. 35 U.S.C. § 102 Anticipation Rejection of Claims and 35 U.S.C. § 103 Obviousness Rejection of Claims

Claims 1-8, 13-16 and 22 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by *Mitchell* (US 6,587,612). Claims 11, 12, 14, 17-19, 24 and 25 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over *Mitchell* in view of *Scolgaard* (US 6,389,190). Claim 26 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Mitchell* in view of *Ghosh* (US 5,910,856) Applicants respectfully traverse these rejections.

With respect to independent claims 1, 13, and 15 as amended, Applicants teach and claim a micro-mirror 10 that has a mirror section 12 for reflecting an incident light at a relative angle (*e.g.*, R1 in Fig. 3). The micro-mirror 10 also has a hinge section 13 that includes a fixed section 13A and a movable section 13B each having a flat surface. The mirror section 12 and the hinge section 13 are integrally formed such that the mirror section 12 extends from the movable section 13B of the hinge section and is formed slanted by approximately 55 degrees to the flat surface (100 in Fig. 5D) of the movable section of the hinge section. The micro-mirror also includes a

drive means that has a bi-morph structure made of two or more of materials (*e.g.*, poly-crystal silicon film 15 and aluminum film 16) having different heat expansion coefficients for deflecting said mirror section to change the relative angle to the incident light. (*See* Application at pg. 6 lines 4-25, Fig. 4). Applicants teach that, by forming the mirror section 12 to extend at a slant angle from the end of the movable section 13A of the hinge section 13, the mirror section 12 can be moved at a high speed to deflect incident light in accordance with the change in the movable section so that the micro-mirror is able to scan a wide bar number or other image.

Mitchell teaches a thermally actuated optical switch that uses a thermally actuated or bimorph cantilever 40 or 300 to move a mirror 25 or 225 mounted to the cantilever 40 or 300. (*See Mitchell* Col. 4, lines 39-44; Col. 5, lines 20-21; Col. 6, lines 14-17; Fig. 2B, 3, 4A, 5A, and 6A-B). *Mitchell*, however, fails to disclose a micro-mirror that has a mirror section that is integrally formed with a hinge section such that the mirror section extends from the movable section of the hinge section and is formed slanted to said flat surface of the movable section of the hinge section. Furthermore, *Mitchell*, discloses that the cantilevers 40 or 300 are adapted to move the mirror in and out of the incident light or orient the mirror for the incident light. (*See Mitchell* Col. 4, lines 39-44). Moreover, the movable portion of the cantilever 40 is not slanted in relation to the mirror 25 in *Mitchell*'s system when the system is at rest or when the system is moved. (*See Mitchell*, Fig. 4A). Thus, *Mitchell* fails to disclose a micro-mirror formed as described in claims 1, 13, and 15 in which the mirror section 12 is slanted in relation to the movably section 13B of the hinge section 13 to change the relative angle at which incident light is reflected for scanning an image.

Accordingly, Applicants submit that *Mitchell* fails to disclose all the limitations of independent Claims 1, 13, and 15, and respectfully requests that the rejection to these claims be withdrawn.

Claims 2-12 depend from Claim 1 and should be deemed allowable for at least the same reasons as Claim 1. Claim 14 depends from Claim 13 and should be deemed allowable for at least the same reasons as Claim 13. Claims 16-22 depend from Claim 15 and should be deemed allowable for at least the same reasons as Claim 15. Therefore, Applicants respectfully request that the rejection to these dependent claims be withdrawn.

IV. Conclusion

In view of the above amendments and remarks, Applicants submit that all claims are clearly allowable over the cited prior art, and respectfully request early and favorable notification to that effect.

Should anything further be required, or if the prosecution of the present patent application may be advanced by a telephone conference, the Examiner is respectfully requested to call the undersigned at (312) 876-8000.

Respectfully submitted,

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IN THE DRAWINGS

Applicants submit one replacement sheet containing Figure 4. Figure 4 has been amended, consistent with the remaining figures and the specification to correct the hinge section 13, the mirror section 12 and the film 27 used to form the mirror and hinge sections. No new subject matter has been added.